Holter Hydroelectric Facility,
House No. 8
1400 feet west of Powerhouse
Wolf Creek vicinity
Lewis and Clark County
Montana

HAER No. MT-94-A

PHOTOGRAPHS
HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
Rocky Mountain Regional Office
National Park Service
P.O. Box 25287
Denver, Colorado 80225-0287

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HISTORIC AMERICAN ENTINEERING RECORD

HOLTER HYDROELECTRIC FACILITY, HOUSE NO. 8

HAER No. MT-94-A

I. INTRODUCTION

Location:	House No. 8 is located within the Holter Hyrdroelectric Facility Historic District, 1400 feet west of the Powerhouse. The facility is near the small community of Wolf Creek vicinity in Lewis and Clark County, Montana
Quad:	Sheep Creek
UTM:	Zone: 12; Easting 423090; Northing 5204550
Date of Construction:	c.1910
Present Owner:	The Montana Power Company 40 East Broadway Butte, Montana 59701
Present Use:	Vacant
Significance:	The Holter Hydroelectric Facility Historic District is significant as one of the most intact hydroelectric generating plants and operators' camps on the Missouri-Madison Project. House No. 8 contributes to the significance of the district as a vernacular adaptation of a contruction camp building for permanent use in the operators' camp.
Historian:	Lon Johnson Renewable Technologies, Inc. Butte, Montana 59701 November 1994

II. HISTORY OF THE HOLTER HYDROELECTRIC FACILITY HISTORIC DISTRICT

A. INTRODUCTION

The Holter Hydroelectric Facility Historic District is a historic hydroelectric generating facility and associated construction and operator's camp situated on the Missouri River about 30 miles north of Helena, Montana (see figure 1). The Holter Hydroelectric Facility Historic District consists of a historic archaeological property (Unit A); the concrete dam and powerhouse and two switchyards (Unit B); and the operator's camp (Unit C). Within the noncontiguous units, the archaeological property, the dam and powerhouse, seven dwellings, 3 garages, and a shed contribute to the district (see figure 2).

B. DAM AND POWERHOUSE CONSTRUCTION[1]

The United Missouri River Power Company (MRPC), headed by Samuel T. Hauser, envisioned a dam and powerhouse at Holter as early as 1906, while work on the second hydroelectric plant on the Missouri River at Hauser was underway. This third plant would supply additional power to the recently consolidated Amalgamated Copper Company which owned the majority of the copper mines in Butte. MRPC planned to begin construction at Holter as soon as it received approval from the Secretary of War (as required by the General Dam Act 1906).[2]

With the collapse of the original Hauser Dam in 1908, MRPC began to experience serious financial difficulties. To ensure the delivery of power to its Butte customers, MRPC attempted to erect Holter Dam and rebuild Hauser Dam at the same time.[3] Engineers of the Capital City Improvement Company, formed to build the Holter Development for MRPC, designed a concrete dam and powerhouse at Holter[4] and signed a contract with Stone and Webster Engineering Corporation of Boston to build the facility. Cost overruns, sluggish progress, and diminishing investor support for MRPC plagued the Holter project. At the height of these misfortunes, MRPC lost its contracts with Amalgamated. As a direct result, Hauser lost control of the power company and its new executive committee abandoned the Holter project in late 1910.[5]

In 1911, MRPC was sold to the Butte Electric and Power Company[6], and in the following year The Montana Power Company was formed and absorbed the assets of the Butte company and its subsidiaries. Montana Power did not revive the Holter Development project for 3 1/2 years, instead concentrating on renovations or new construction at Black Eagle, Ryan, Hauser, and Hebgen.[7]

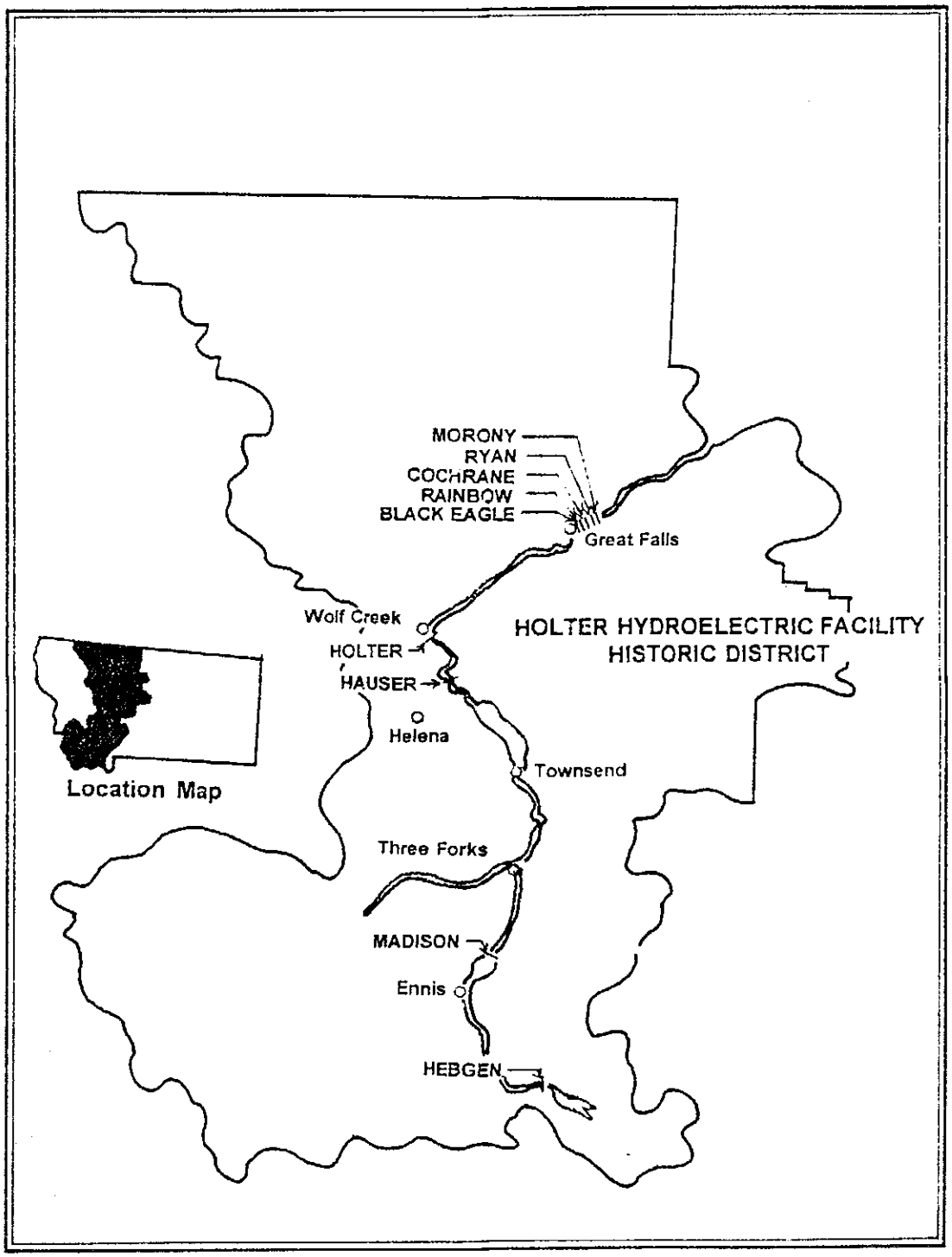
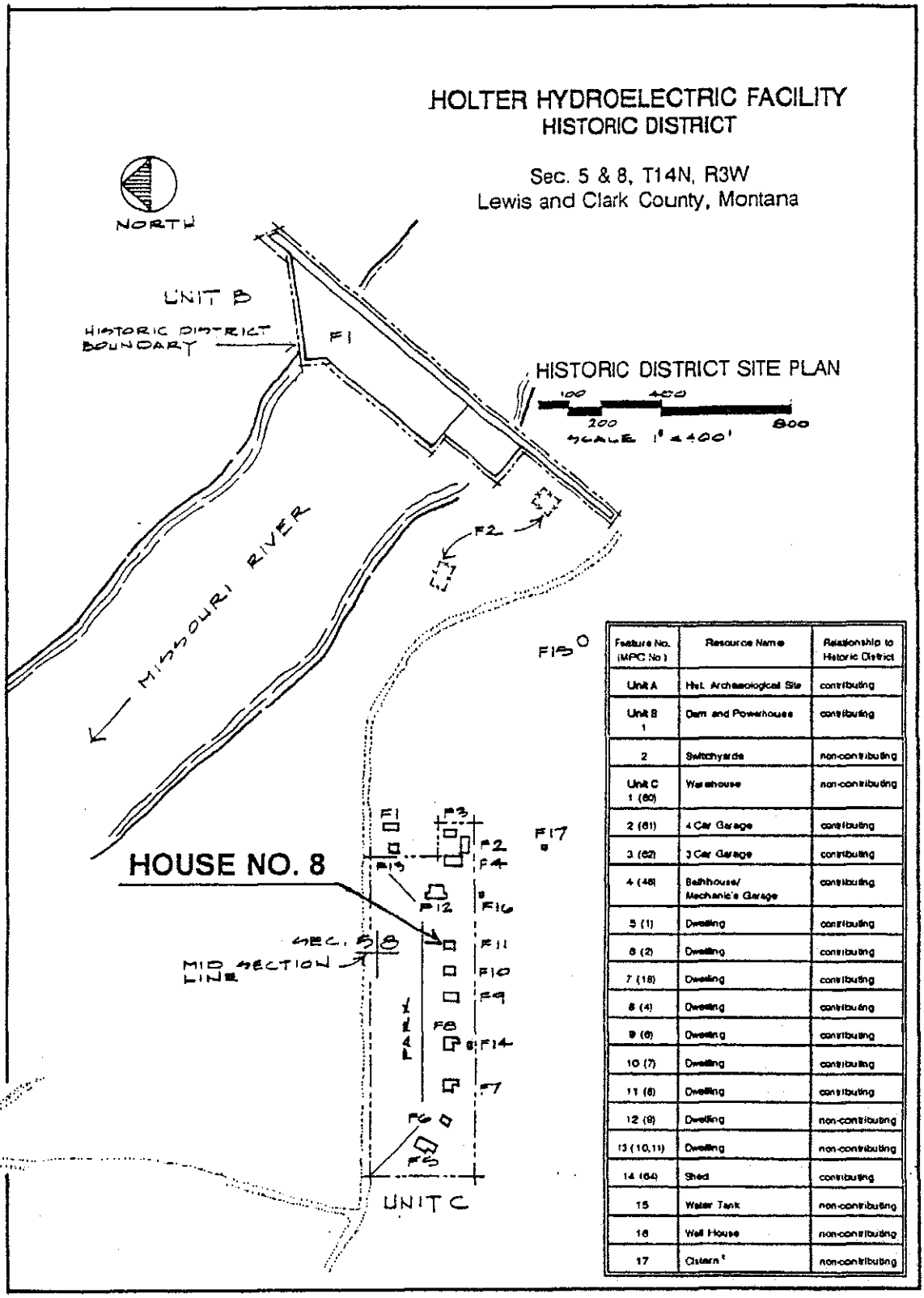


Figure 1: Holter Hydroelectric Facility Area Map



Feature No. (MPC No.)	Resource Name	Relationship to Historic District
Unit A	Hist. Archaeological Site	contributing
Unit B 1	Dam and Powerhouse	contributing
2	Switchyards	non-contributing
Unit C 1 (60)	Warehouse	non-contributing
2 (61)	4 Car Garage	contributing
3 (62)	3 Car Garage	contributing
4 (48)	Bathhouse/ Mechanic's Garage	contributing
5 (1)	Dwelling	contributing
6 (2)	Dwelling	contributing
7 (18)	Dwelling	contributing
8 (4)	Dwelling	contributing
9 (6)	Dwelling	contributing
10 (7)	Dwelling	contributing
11 (8)	Dwelling	contributing
12 (9)	Dwelling	non-contributing
13 (10,11)	Dwelling	non-contributing
14 (64)	Shed	contributing
15	Water Tank	non-contributing
16	Well House	non-contributing
17	Cistern	non-contributing

Figure 2. Map of Holter Hydroelectric Facility Historic District.

Construction at Holter commenced again in March 1916. Part of the foundation for the concrete dam, including the apron and some energy baffles, had been poured in 1909-1910.[8] The construction camp may have also been built at that time. Montana Power hired the Western Office of Charles T. Main in Butte to design a hydroelectric facility which would incorporate as much of the 1909-1910 concrete work as possible.[9] Prepared by Henry A. Herrick, an engineer for Charles T. Main, the design of the dam resembled the 1908 Capital City Improvement Company design in several respects, including dam height, spillway shape, and integration of the powerhouse as part of the dam.[10] In contrast, however, Herrick specified vertical turbines and generators,[11] a redesigned shape and internal arrangement for the powerhouse, waste gates as part of the headwater control system, and some architectural changes to the downstream face of the dam.[12]

The Holter Development was put on-line specifically to supply power to the Butte, Anaconda & Pacific and Chicago, Milwaukee & St. Paul Railways[13] which had been electrified in 1913 and 1915, respectively. Power was fed into Montana Power's distribution network via connections to the Great Falls-Morel line and the East Helena switchyard. The Holter facility also contributed to Butte and Anaconda's power supply. Being closer to major supply points than the Great Falls plants, transmission loss on the system as a whole was reduced by using Holter power.[14]

C. CONSTRUCTION AND OPERATORS' CAMP

In general, erection of a construction camp was considered an integral component of the larger project of the power plant construction. It is likely, in fact, that construction of the camp was the first major physical act in the process of building the dam and powerplant. Although the various construction camps at developments on the Missouri-Madison Hydroelectric Project were constructed over a period of some four decades, they shared many characteristics of design, form, and materials. The Missouri-Madison Project camps generally featured a large boardinghouse/bunkhouse and mess hall for unmarried workers, as well as a number of small, vernacular cottages for married employees. A variety of ancillary structures, including garages, storage sheds, and bath bunkhouses , were also provided. The total number of buildings erected varied from camp to camp, depending on the needs of the site.[15]

Because of the relatively isolated location of Holter, the Stone and Webster Engineering Corporation, which reportedly employed 600 men during its 1909-10 construction work,[16] would have constructed a large camp on-site to house laborers and professionals. Documentation of the appearance of the camp, however, is limited to an early 1916 site plan copied from a Stone and Webster drawing.[17] The map shows approximately 100 construction camp buildings spread over a wide area. No photographic, written, or oral documentation has been found corroborating the actual existence of any or all of the buildings.

The construction camp at the Holter site during Montana Power's 1916-18 completion of the dam and power house is more completely documented. A 1917 photograph of the camp shows that, in addition to the buildings on the Stone and Webster drawing, Montana Power constructed several new buildings, including at least 13 dormitory-style buildings.[18] The Holter construction camp was the largest Montana Power-owned camp, both in terms of area covered and numbers of buildings and tents used. Besides the more typical construction camp buildings, it included a photographic studio, a school, and a hospital. A sanitary sewer was also installed. The number of workers housed at the camp varied from 400 to 725 in different phases of the project.[19]

Construction camp buildings were never intended for long-term use, and as a result were built quickly and cheaply. Early Montana Power site maps describe many such buildings as having "plank" foundations, with walls constructed of "tar paper & boards." Photographs of the Holter construction camp support this description, revealing the camp as an aggregation of varying size buildings without permanent foundations and with roofs and walls covered with roofing paper. More comfortable accommodations were not really needed, since much of the camp became superfluous upon completion of the construction project. Although some construction camp buildings saw continued residential use during the early years of a facility's operation at other Montana Power dam locations, nearly all of these buildings had disappeared by the late 1920s.[20]

The Holter operator's camp is an exception to the general pattern of replacing construction camp buildings with newly-constructed, permanent housing. The seven contributing houses within the Holter Hydroelectric Facility Historic District date from the construction period. Photographic evidence documents that all seven were present as early as 1917, and maps on file at Montana Power suggest as early as 1916, during construction by C.T. Main (see figure 4). Other maps on file at Montana Power suggest that six of the seven may have been constructed earlier,

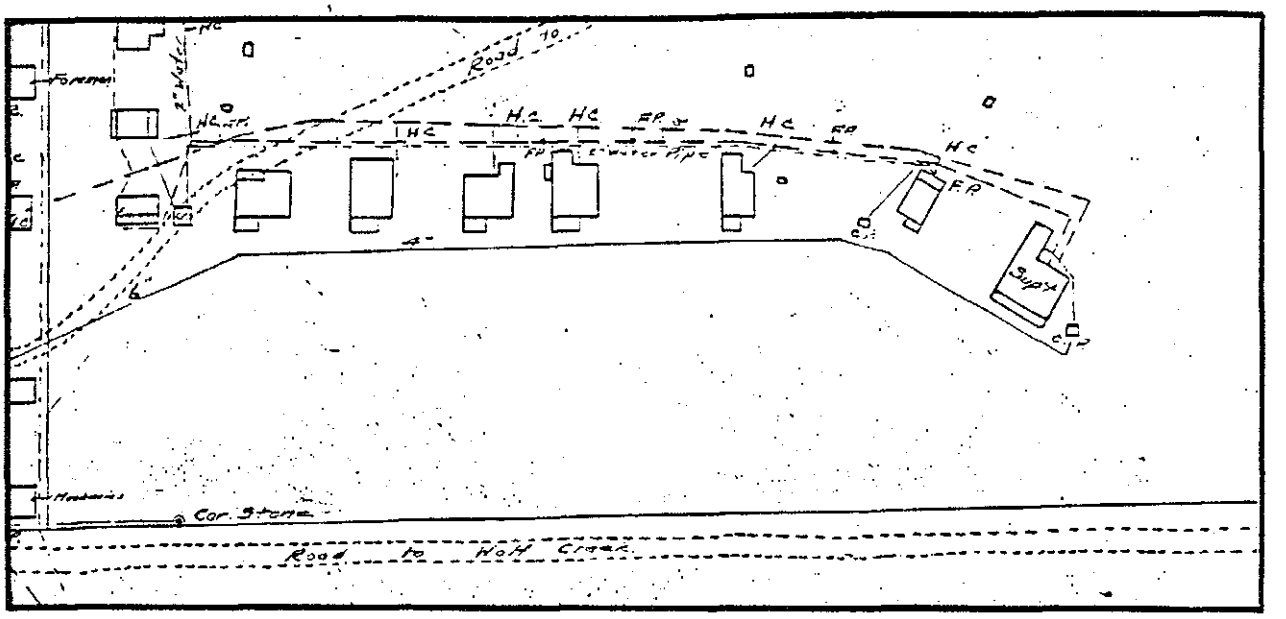


Figure 3. Portion of map reproduced on February 8, 1916 from Stone and Webster drawing. House No. 8 may have evolved from the building on the left labeled "Engineers." (MPC Drawing #17304-E).

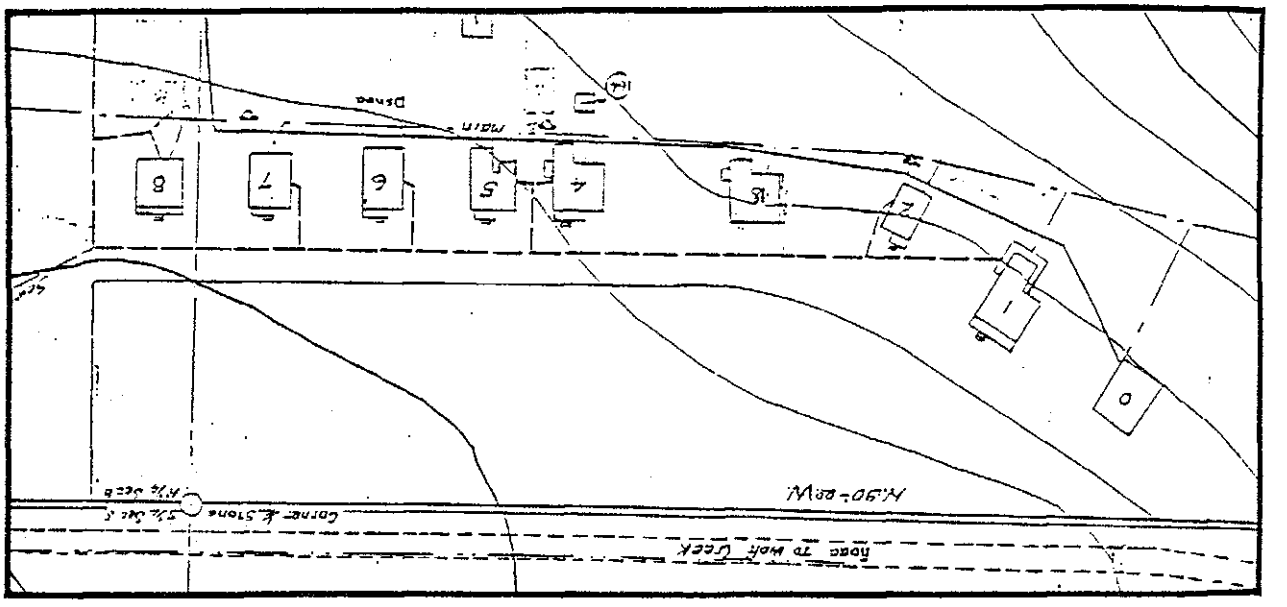


Figure 4. Portion of map showing the Holter Development on June 28, 1916. House No. 8 appears in its current form except for back porch. (MPC Drawing #43693-045).

during the 1908-1910 construction by Stone and Webster (see figure 3). However, there is no documentary evidence of the existence of the houses before 1916. Montana Power expenditure records from 1921 through 1923 list the construction of 10 "new cottages" for employees at Holter.[21] Of the ten houses shown on a 1944 map of Holter,[22] eight existed as part of the construction camp, and seven of these remain as contributing buildings to the Holter Hydroelectric Historic District. The 1921-23 expenditures cannot be explained except that they represent conversion of the temporary construction houses, into permanent operator residences, by the addition of concrete foundations, siding, porches, and wood shingles.

D. HOUSE No. 8

House No. 8 at the Holter Hydroelectric Facility is a vernacular representation of the evolution of a temporary construction camp building into a permanent operator's camp house. House No. 8 was originally constructed as a simple, rectangular, side-gabled building. The wood-frame building may have served as an office for the construction company's engineers. The original intention of the construction company as to the disposal of House No. 8 after completion of the dam--whether it was to be demolished or retained for permanent occupation in the operator's camp--is unknown. The use of light-weight framing members, its original exterior covering of building paper, and the apparent lack of a foundation, however, suggests a temporary use.

A 1917 photograph in which the building can be seen shows modifications made to the original building. A rear addition and a full-length, shed-roofed front porch are present. Earth piled around the foundation suggests that it was constructed on wood piers; piers are clearly visible under the front porch. The earth would have provided some protection from cold winter winds blowing beneath an otherwise raised building. The building's walls and roof are covered with roofing felt.

House No. 8 was remodeled to its present appearance, probably in the early 1920s. It became a permanent building within the operator's camp. A concrete foundation was added beneath the building, the roof was shingled, and the walls were sided with drop siding. The open shed-roofed front porch was also replaced with a hipped-roof porch that included a solid balustrade. An enclosed rear porch was added sometime after the siding. The house was originally painted white with green trim. The shingles were also stained green.

III. ARCHITECTURAL DESCRIPTION

House No. 8 is located in the Holter operator's camp. The camp consists of nine houses (two are non-contributing to the district), associated outbuildings, four plant and camp maintenance buildings, and a domestic water system. The seven houses contributing to the historic district front a large park measuring 840 x 180 feet. The park has over 150 mature trees including willows, box elders, elms, locusts, and others. Lawns also surround the houses. House No. 8 is the eastern-most house in the row.

House No. 8 is almost square, measuring 32'-5" x 32'-0" (see figure 3). The original gable roof became a cross-gable with the construction of the rear addition. The roof structure is a primitive truss composed of 2x4 rafters at 4-foot on center. The bottoms of the rafters are tied together with 1x6 ceiling joists. Diagonals of 1x6s run from the ridge to the ceiling joist and back to the rafter. The diagonals, besides providing additional structural support to the undersized rafters and joists, also may have permitted a free-spanning ceiling without interior partitions if the building was originally used as an office. The roof is sheathed with rough 1-inch boards. Some of the original roofing felt, held in-place with roofing caps (shields), is visible in the attic. The roof is now covered with wood shingles. The ridge is capped with a galvanized ridge roll with round ridge roll finials at the ends. A brick chimney was originally located toward the west end of the ridge, but was removed prior to the house being shingled.

The walls of the house are constructed of 2x4s sheathed on the interior and exterior with rough 1-inch boards. The siding is fitted against 5-inch corner boards. An 8-inch wide rake molding is trimmed with a small cornice molding. A 3-inch wide fascia board covers the ends of the slightly projecting rafter tails. A water table at the foundation is created by a slightly projecting and beveled drip above a 10-inch apron.

The full-length front porch has a hipped roof covered with wood shingles. Chamfered, square wood posts support the roof. The solid balustrade is constructed of a single layer of vertically-placed, beaded wainscotting. The porch ceiling is also covered with beaded wainscotting. Two concrete steps provide access from the sidewalk to the porch.

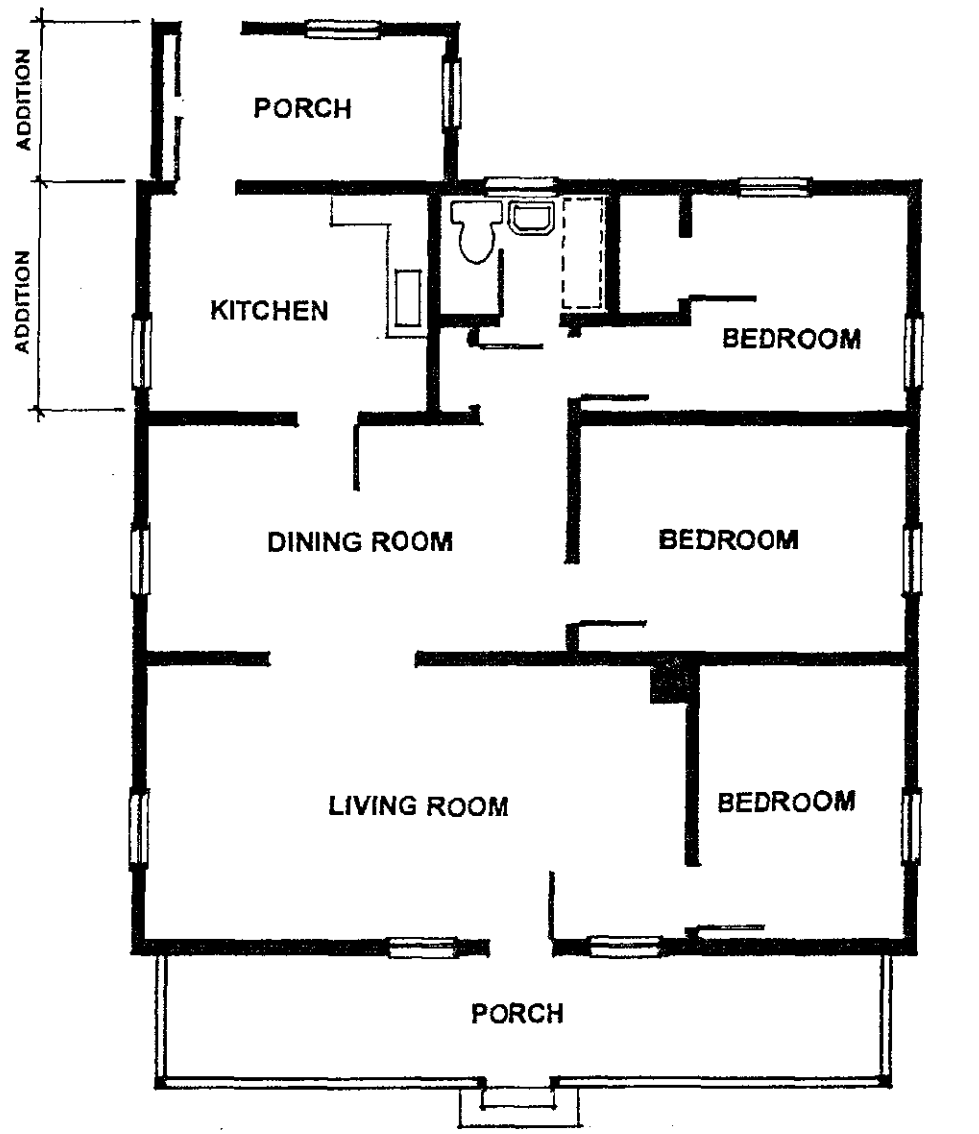


Figure 5. House No. 8 Floor Plan.

All windows on the north, east, and west sides of the house are wood six-over-six double hung units. The muntins are quite narrow. The north side of the house has one six-over-six window and a three-over-three double hung unit. The later, rear porch addition has wood fixed three-over-three windows on the north and west sides. The front door is wood with five horizontal panels. The rear door is wood with four vertical panels.

The house has six rooms and a bathroom. Three bedrooms are located along the west side, and a living room, dining room, and kitchen are located along the east side. The bathroom is between the kitchen and the rear bedroom. Interior walls are frame with 1-inch wood sheathing on both sides. The sheathing is covered with ¼-inch fiberboard. Wood battens cover the butt-joints of the 8-foot long sheets of fiberboard. In some rooms, the layout of the fiberboard was carefully planned to provide an aesthetic layout of the battens. Floors in the building were originally painted 1x6 tongue-and-groove boards; they were later covered with linoleum. Most remaining interior doors (some are missing and some have been replaced) are wood with 4-panels. The historic doors appear to have been provided with rim lock sets (surface mounted cases) and porcelain knobs.

IV. FUTURE OF THE PROPERTY

The Montana Power Company plans to demolish House No. 8 at the Holter Hydroelectric Facility (FERC Project No. 2188). The Company has sponsored recording the building to the standards of the Historic American Engineering Record.

V. ENDNOTES

1. This section is taken from the National Register of Historic Places, Multiple Property Documentation Form entitled "Hydroelectric Generating Facilities on the Missouri and Madison Rivers in Western Montana," by Renewable Technologies, Inc. and Ethnoscience, May 1991.

2. Alan S. Newell, "A Victim of Monopoly: Samuel T. Hauser and Hydroelectric Development on the Missouri River, 1898-1912" (M.A. Thesis, University of Montana, 1979), 59-61.

3. Ibid., 65-67, 98.

4. "The Capital City Power Plant of the United Missouri River Power Co.," Engineering News, 20 October 1910: 430-431.

5. Newell, "A Victim of Monopoly," 98-99, 114, 121-122.

6. Ibid., 128.

7. Montana Power Company, "Story of Montana Power," (1941), 38, 64-71.

8. Photograph in Holter I photograph album, 1916, located at The Montana Power Company, Hydro Engineer Department, Butte.

9. Cecil Kirk, "History of Montana Power," II: 9: 25. Unpublished report located at The Montana Power Company, Butte.

10. "The Capital City Power Plant," Engineering News, 430-431.

11. According to Duncan Hay (Hydroelectric Development in the United States, 1880-1940, report prepared for Edison Electric Institute, 1990, 86-87), between 1912 and 1915, the hydroelectric industry converted from the installation of horizontal turbines and generators to vertical ones. The widespread acceptance of the Kingsbury thrust bearing after abandonment of the original Holter project led to the switch to the new turbine mount design for the 1916-1918 construction.

12. "The Montana Power Company Holter Development General Plan of Dam, Intake & Powerhouse," MPC Drawing No. 22354-C sheet 2.

13. "Great Power Plant on Missouri River," Mineral County Independent, 7 October 1918.

14. Kirk, "History of Montana Power," II: 9: 27.

15. Multiple Property Documentation Form.

16. "Ninety-one Thousand Horse Power Development near Helena," Helena Independent, 29 May 1910: 9; "Rushing Work on Big Missouri River Dams," Helena Independent, 20 February 1910, 9.

17. "The Montana Power Co., General Plan of Holter Development, Reproduced from Stone & Webster Draw. #R16100," MPC Drawing No. 17304-E.

18. Photograph, located at the Holter Powerhouse.

19. Statement of Business Done by Great Falls Commercial Company at Holter, MT, years 1916-1917, n.d., in Phoenix Utility Company correspondence on Holter Dam, unnumbered file, miscellaneous box, Montana Power Company Predecessor Records, Montana Historical Society Archives, Helena; "Gigantic Enterprise Undertaken by Montana Power Company at the Holter Dam," Helena Independent, 13 August 1916, 1; "New Lake Twenty-Seven Miles Long, will Result when Holter Dam is Completed," Helena Independent, 7 October 1917, 1.

20. Multiple Property Documentation Form.

21. "Index of Expenditure and Improvement Requisitions, Electric, For Years - 1913 to Date [1940]. Typescript copy located at The Montana Power Company's Record Services, Box No. WH-200 5.

22. "The Montana Power Company, Insurance Map of Holter, Montana," revised to 1944, MPC Drawing No. 22568-D.

VI. BIBLIOGRAPHY

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The Montana Power Company. "General Plan of Holter Development, Reporduced from Stone & Webster Draw. #R16100." Montana Power Company Drawing No. 17304-E.

_____. "Holter Development General Plan of Dam, Intake & Powerhouse." Montana Power Company Drawing No. 22354-C sheet 2.

_____. "Insurance Map of Holter, Montana." Revised to 1944. Montana Power Company Drawing No. 22568-D.

_____. Photograph in Holter I album. 1916. Located at Montana Power Hydro Engineer Department, Butte.

_____. Photograph located at the Holter Powerhouse.

_____. "Story of Montana Power." (1941).

"New Lake Lake Twenty-Seven Miles Long, will Result when Holter Dam is Completed." Helena Independent. 7 October 1917.

Newell, Alan S. "A Victime of Monopoly: Samuel T. Hauser and Hydroelectric Development on the Missouri River, 1898-1912." M.A. Thesis, University of Montana, 1979.

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